DETAILED ACTION

Applicants' response, filed 17 July 2008, has been fully considered. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Claims 16-22 and 24-28 are currently pending. Claims 1-15 and 23 have been cancelled.

Claim 28 is withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 29 August 2007.

Specification Objections

The Title of the invention "Method of Specifying SNP" is grammatically incorrect and should be corrected to recite either "A Method (or "Methods") of Specifying a SNP" or "A Method (or "Methods") of Specifying SNPs". Correction is requested.

Claim Objections

Claim 17 is objected to because of the following informalities:

Claim 17 recites, "defining an SNP". This is grammatically incorrect and should be amended to recite, "defining a SNP".

Claim 17 recites, "calculating differences of a statistical amount data from the case". The phrase appears to be missing a word or contain an extra word. Clarification is requested.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 16-22 and 24-27 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter, for the reasons set forth in the previous Office Action and re-iterated below.

The instant claims, as amended, are directed to methods of "identifying" a SNP that causes disease susceptibility or drug responsiveness. The claims do not recite statutory methods under 35 USC 101. The recited claims do not set forth any transformation of matter, nor do they provide a concrete, tangible and useful result. The result of claim 16 is a "correlating the target SNP with responsiveness to a drug or with susceptibility to a disease". The SNP data is not linked to any particular disease susceptibility or drug response.

As stated in MPEP 2106, section IV, the claims will be evaluated for providing a practical application, if the claims are found to cover a judicial exception (*i.e.*, Law of Nature, Natural Phenomenon, or an Abstract Idea). In the instant case, the claims are drawn to an abstract idea and therefore must be evaluated further for providing a practical application of the judicial exception. A practical application is claimed if the claimed invention physically transforms an article or physical object to a different state or thing, or if the claimed invention otherwise produces a concrete, tangible, and useful result. In the instant case, a physical transformation of matter is not provided, as the instant claims merely provide steps of obtaining data, defining domains within the data, and making a correlation. Therefore, none of said steps result in a physical transformation of matter such that the whole of the claim is statutory.

As such, the claims must be further evaluated for providing a practical application that produces a concrete, tangible and useful result. The focus is not on the steps taken to achieve a particular result, but rather the final result achieved by the claimed invention. A claim may be statutory where it recites a result that is concrete (i.e. reproducible), tangible (i.e. communicated to a user), and useful (i.e. a specific and substantial). In the instant case, the claims **do not recite a tangible result** such that the result is useful to one skilled in the art. The final step of "correlating" does not provide a tangible result that is useful to one skilled in the art. Rather, the claims merely encompass *in silico* results with no specific output. The tangible requirement does require that the claim must recite more that a 101 judicial exception, in that the process claim must set forth a practical application of that 101 judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because no "substantial practical application."). In the instant case, no real-world result is set forth, as the results could merely reside *in silico*.

Claim Rejections - 35 USC § 112-1st paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 16-22 and 24-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. *This is a new matter rejection.*

Claim 16 has been amended to recite, "defining a scanning domain for a gene thought to cause disease susceptibility or responsiveness to a drug or defining a scanning domain in a genomic region or in one or more chromosomes thought to cause disease susceptibility or responsiveness to a drug".

Applicant has not provided support for such a limitation nor is support apparent in the instant specification as originally filed. The instant specification indicates "determining a scanning domain" and "determining a typing SNP" and "estimating markers", for example, at page 11. However, limitations regarding a "gene thought to cause disease or responsiveness to a drug" or "defining a scanning domain in a genomic region or in one or more chromosomes" is not described. Applicant is invited to point to page and line number for such support.

Claim 16 has been amended to recite, "shortening the physical distance of the scanning domain by estimating the base sequence domain near a target SNP". Applicant has not provided support for such a limitation nor is support apparent in the instant specification as originally filed. The instant specification indicates that the "scanning domain is gradually narrowed down from an initially large scanning domain to a more localized domain" (page 13). However, there is no teaching of shortening the physical distance by estimation. Applicant is invited to point to page and line number for such support.

Claim 16 has been amended to recite, "correlating the target SNP with responsiveness to a drug or with susceptibility to a disease". Applicant has not provided support for such a limitation nor is support apparent in the instant specification as originally filed. The instant

specification indicates "the object of SNP function analysis is to compare SNP data between sample groups that are separated according to whether or not they express a certain characteristic (page 19). However, there is no teaching of correlating the SNP to a particular disease or drug responsiveness. Applicant is invited to point to page and line number for such support.

Claim 17 has been amended to recite, "defining an SNP near the target SNP with a linkage disequilibrium of the target SNP as a marker SNP, and shortening the physical distance of the scanning domain that contains the marker SNP by calculating differences of a statistical amount data from the case group and data from the control group". Applicant has not provided support for such a limitation nor is support apparent in the instant specification as originally filed. The instant specification indicates scanning domain is gradually narrowed down from an initially large scanning domain to a more localized domain" (page 13). However, there is no teaching of shortening the physical distance by estimation. Applicant is invited to point to page and line number for such support.

Claim 19 has been amended to recite, "selecting the SNPs to obtain data by SNP typing in the scanning domain, wherein an interval between the selected SNPs is uniform for the case and control group". Applicant has not provided support for such a limitation nor is support apparent in the instant specification as originally filed. The instant specification does not teach intervals and uniformity. Applicant is invited to point to page and line number for such support.

Claims 18, 20-22 and 24-27 are rejected as being dependent from the claims above.

Claim Rejections - 35 USC § 112-2nd paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 16-22 and 24-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 16, and claims dependent therefrom, the metes and bounds of "disease susceptibility" and "drug responsiveness" are still unclear. How is a SNP determined to be "related" to susceptibility? Which diseases? What constitutes a drug response, or a change in responsiveness? The specification fails to set forth clear definitions of what is intended to be encompassed by these terms. Clarification is requested.

Claim 16 recites, "selecting SNPs to obtain data by SNP haplotyping analysis in the scanning domain". It is unclear as to what is intended by this limitation. Is it that SNPs are selected for haplotype analysis if they are in the scanning domain or that haplotyping analysis occurs in the scanning domain? Clarification is requested.

Claim 16 recites, "defining a base sequence domain". It is unclear as to the relationship between the base sequence domain and the scanning domain? Are they the same domain? Are they different? If they are different it is unclear was to how the base sequence domain relates to the previous steps of the claim. Clarification is requested.

Claim 16 recites, "defining a base sequence domain that contain a specified number of SNPs determined by a range of several SNPs to several hundred SNPs as a window". It is unclear as to how a base sequence domain is defined as a window. Perhaps the domain is represented as a window. It is further unclear what the window has to do with the remainder of the claim. Clarification is requested.

Claim 19 recites, "selecting the SNPs to obtain data by SNP typing in the scanning domain, wherein an interval between the selected SNPs is as uniform for the case group and the control group for identifying the target SNP". This phrase is nonsensical Is as uniform as what? Clarification is requested.

Claim 19 recites, "and when there is a statistically significant value between said statistical amount and said reference statistical amount that exceeds a first threshold". This phrase is nonsensical. When there is a statistically significant value, then what? Clarification is requested.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

As a reminder, Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15. The effective filing date for this application is 1/15/2003.

1. Claims 16-22 and 24-27 remain rejected under 35 U.S.C. 102(e) as being anticipated by Margus, for the reasons set forth in the previous Office Action and re-iterated below.

Margus et al. (US 6,955,883 having priority to 3/26/02) discloses life science business models which obtain genomic information from a variety of populations and individuals, define domains or stretches of DNA which may contain SNP's of interest, identify SNP's within the domains, and specify targets. The targets may be associated with drug responsiveness or disease susceptibility. Wet steps of SNP typing may be performed, and statistical analyses of the significance of the findings can be performed. As such, Margus anticipates the methods of the claims.

2. Claims 16-22 and 24-27 remain rejected under 35 U.S.C. 102(e) as being anticipated by Ramnarayan et al.. for the reasons set forth in the previous Office Action and re-iterated below.

Ramnarayan et al. (US 2003/0158672 having priority to 11/10/2000) discloses methods of using SNP information to generate 3 D models of drug targets. These methods obtain genomic information for genes or proteins which are targets of a defined drug from a variety of populations and individuals, define domains or stretches of DNA within those sequences which may contain SNP's of interest, identify SNP's within the domains, and specify targets. The targets may be associated with drug responsiveness. Wet steps of SNP typing may be performed, and statistical analyses of the significance of the findings can be performed. As such, Ramnarayan anticipates the methods of the claims.

3. Claims 16-22 and 24-27 remain rejected under 35 U.S.C. 102(a) as being anticipated by Xu (GLAXO WO 2002/20835), for the reasons set forth in the previous Office Action and re-iterated below.

Xu et al. (WO 2002/20835, published 3/14/02: PTO-1449) discloses methods of associating phenotypes with haplotypes. These methods obtain genomic information from a variety of populations and individuals, define domains or stretches of DNA which may contain SNP's of interest, identify SNP's within the domains, and specify targets. The targets may be associated with phenotypes such as drug responsiveness or disease susceptibility. Wet steps of SNP typing may be performed, and statistical analyses of the significance of the findings can be performed. As such, Xu anticipates the methods of the claims.

Response to Applicant's Arguments Regarding Margus et al.

1. Applicant argues that "Margus discloses methods that require analyzing all SNPs over more than 10,000,000 bases" and that "because Margus does not teach the limitations of defining a scanning domain for a gene thought to cause disease susceptibility or responsiveness to a drug or defining a scanning domain in a genomic region or in one or more chromosomes thought to cause disease susceptibility of responsiveness to a drug AND selecting SNPs to obtain data by SNP haplotyping in the scanning domain, claims 16-22 and 24-27 are not anticipated".

This is not persuasive. Margus et al. teach scanning all or parts of genomes as seen on Figure 1. Margus et al. further disclose collection of control samples and case samples and

scanning the genomes for SNPs and scanning subsets (Figure 2). SNPs are grouped into haplotype blocks. Thus, Margus et al. teach scanning domains and using haplotying analysis.

Response to Applicant's Arguments Regarding Ramnarayan et al.

1. Applicant argues that "because Ramnrayan et al. does not teach the limitations of 'identifying an SNP that causes disease susceptibility or responsiveness to a drug' or 'correlating the target SNP with responsiveness to a drug or with susceptibility to a disease' claims 16-22 and 24-27 are not anticipated by this reference".

This is not persuasive. As taught at page 2, paragraph [0015], Ramnrayan et al. teach that models may be selected based on clinical information, for example, the structural variants may be derived based on patients receiving a specific treatment regimen or exhibiting a particular clinical response to a given drug or on the duration of a particular drug treatment". Therefore, Ramnrayan et al. teach identification of polymorphisms (SNPs) that cause drug responsiveness and correlation of that SNP with the drug responsiveness.

Response to Applicant's Arguments Regarding Xu

1. Applicant argues that because Xu does not teach the limitations of 'identifying an SNP that causes disease susceptibility or responsiveness to a drug' or 'correlating the target SNP with responsiveness to a drug or with susceptibility to a disease' claims 16-22 and 24-27 are not anticipated by this reference".

This is not persuasive. Xu teaches a method for performing an association study in which a correlation between a computed haplotype and phenotype is analyzed (page 1, last paragraph). If such a correlation is detected, then this indicates that the region in which the haplotype occurs is able to affect the phenotype (page 2, 1st paragraph). Page 6, 3rd paragraph describes the phenotype to be presence or absence of a trait or magnitude of a trait. Typically the phenotype is related to a disease, such as the presence or absence of a disease. The phenotype may be susceptibility to the disease or may be the response to a medical or pharmaceutical treatment. Therefore, Xu teaches the instant claim limitations.

Conclusion

No claims are allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiries

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The Central Fax Center Number is (571) 273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lori A. Clow, Ph.D., whose telephone number is (571) 272-0715. The examiner can normally be reached on Monday-Friday from 10 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached on (571) 272-0720.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

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October 22, 2008
/Lori A. Clow, Ph.D./
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